

### IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A method for forming an electronic device comprising:  
forming a first conductive layer in an opening in a dielectric structure supported by a substrate, the first conductive layer being an adhesion/barrier layer;  
depositing a seed layer on the first conductive layer;  
forming a core conductive layer on the seed layer, the core conductive layer substantially including of one or more of aluminum, silver, or gold;  
subjecting the core conductive layer to a H<sub>2</sub> plasma treatment; and  
depositing a capping layer on the core conductive layer after the H<sub>2</sub> plasma treatment.
2. (Previously Presented) The method of claim 1, wherein forming the first conductive layer includes forming a layer of a refractory metal.
3. (Previously Presented) The method of claim 1, wherein forming the first conductive layer includes forming a layer of a compound of nitrogen and a tantalum alloy or a compound of nitrogen and a tungsten alloy.
4. (Previously Presented) The method of claim 1, wherein depositing the seed layer and the capping layer includes depositing the seed layer and the capping layer using low energy ion implantation.
5. (Previously Presented) The method of claim 4, wherein depositing the seed layer and the capping layer using low energy ion implantation includes using an implant energy ranging from about 0.1 keV to about 2 keV.
6. (Previously Presented) The method of claim 1, wherein forming the core conductive layer includes depositing the core conductive layer using a CVD process.

7. (Previously Presented) The method of claim 1, wherein forming the core conductive layer includes forming the core conductive layer at a temperature ranging from room temperature to about 250°C.
8. (Previously Presented) The method of claim 1, wherein depositing the capping layer includes depositing one or more materials selected from titanium, zirconium, hafnium, or nitrides of these elements.
9. (Previously Presented) The method of claim 1, wherein depositing the capping layer includes depositing the capping layer having a thickness ranging from about 5 Å to about 40 Å.
10. (Previously Presented) The method of claim 1, wherein the method further includes removing at least a portion of the dielectric structure, after depositing the capping layer on the core conductive layer, to form an air bridge structure.
11. (Previously Presented) The method of claim 1, wherein forming the first conductive layer includes forming the first conductive layer in the dielectric structure having multiple dielectrics layers, such that the core conductive layer is within one dielectric layer in the dielectric structure.
12. (Previously Presented) The method of claim 11, wherein forming the first conductive layer in the dielectric structure having multiple dielectrics layers includes forming the first conductive layer within an opening in a polymer layer, a foamed polymer layer, a fluorinated polymer layer, a fluorinated oxide layer, or an aerogel layer.
13. (Withdrawn – Currently Amended) A method for forming an integrated circuit comprising:
  - forming one or more device structures on a substrate;
  - forming a polyimide layer above a number of first level vias provided for electrical coupling to at least one of the one or more device structures;

forming a number of trenches in the polyimide layer;  
forming a first conductive layer in the number of trenches, the first conductive layer being an adhesion/barrier layer;  
depositing a seed layer on the first conductive layer;  
depositing a core conductive layer on the seed layer, the core conductive layer substantially including ~~of~~ one or more of aluminum, silver, or gold;  
subjecting the core conductive layer to a H<sub>2</sub> plasma treatment; and  
depositing a capping layer on the conductive layer after the H<sub>2</sub> plasma treatment.

14. (Withdrawn) The method of claim 13, wherein forming the first conductive layer includes forming a layer of a refractory metal.

15. (Withdrawn) The method of claim 13, wherein forming the first conductive layer includes forming a layer of a compound of nitrogen and a tantalum alloy or a compound of nitrogen and a tungsten alloy.

16. (Withdrawn) The method of claim 13, wherein depositing the capping layer includes depositing material by ion implantation into the core conductive layer to form the capping layer.

17. (Withdrawn) The method of claim 13, wherein depositing the capping layer includes depositing one or more materials selected from titanium, zirconium, hafnium, or nitrides of these elements.

18. (Withdrawn) The method of claim 13, wherein forming the polyimide layer above a number of first level vias includes:

forming a field oxide layer and a Si<sub>3</sub>N<sub>4</sub> layer above the one or more device structures;  
forming contact holes through the field oxide layer and the Si<sub>3</sub>N<sub>4</sub> layer;  
depositing TiN in the contact holes;  
forming tungsten on the TiN to form a contact plug; and  
applying the polyimide on the Si<sub>3</sub>N<sub>4</sub> layer and contact plug.

19. (Withdrawn) The method of claim 13, wherein forming the number of trenches in the polyimide layer includes:
- forming an oxide layer on the polyimide layer;
  - forming a layer of  $\text{Si}_3\text{N}_4$  on the oxide layer;
  - forming a damascene image in the oxide and  $\text{Si}_3\text{N}_4$  layers; and
  - removing polyimide at locations of the damascene image.
20. (Withdrawn) The method of claim 19, wherein the method further including removing the layer of  $\text{Si}_3\text{N}_4$  using a selective etch after forming the first conductive layer, and after depositing the capping layer subjecting the oxide layer to an etchant that removes the oxide layer without substantially altering the polyimide layer.
21. (Withdrawn) The method of claim 13, wherein depositing the core conductive layer includes selectively depositing aluminum.
22. (Withdrawn) The method of claim 13, wherein depositing the core conductive layer includes selectively depositing aluminum by plating in an ambient air environment.
23. (Withdrawn) The method of claim 13, wherein depositing the capping layer on the core conductive layer includes implanting zirconium ions into the core conductive layer.
24. (Withdrawn) The method of claim 13, wherein forming the polyimide layer includes forming a foamed polyimide, a fluorinated polyimide, or a foamed fluorinated polyimide.
25. (Withdrawn) The method of claim 13, wherein the method further includes a heat treatment at a temperature ranging from  $250^\circ\text{C}$  to about  $350^\circ\text{C}$  for a period ranging from about one hour to about two hours after depositing the capping layer on the core conductive layer.

26. (Withdrawn) The method of claim 13, wherein the method further includes removing at least a portion of the polyimide layer, after depositing the capping layer on the core conductive layer, to form an air bridge structure.

27. (Withdrawn – Currently Amended) A method for forming an integrated circuit comprising:

- forming one or more device structures on a substrate;
- forming a first oxide layer above a number of first level vias for electrical coupling to at least one of the one or more device structures;
- forming a number of trenches in the first oxide layer;
- forming a first conductive layer in the number of trenches, the first conductive layer being an adhesion/barrier layer;
- depositing a seed layer on the first conductive layer;
- depositing a core conductive layer on the seed layer, the core conductive layer substantially including ~~of~~ one or more of aluminum, silver, or gold;
- subjecting the core conductive layer to a H<sub>2</sub> plasma treatment; and
- depositing a capping layer on the core conductive layer after the H<sub>2</sub> plasma treatment.

28. (Withdrawn) The method of claim 27, wherein forming the first conductive layer includes forming a layer of a refractory metal.

29. (Withdrawn) The method of claim 27, wherein forming the first conductive layer includes forming a layer of a compound of nitrogen and a tantalum alloy, or a compound of nitrogen and a tungsten alloy.

30. (Withdrawn) The method of claim 27, wherein depositing the capping layer includes depositing material by ion implantation into the core conductive layer to form the capping layer.

31. (Withdrawn) The method of claim 27, wherein depositing the capping layer includes depositing one or more materials selected from titanium, zirconium, hafnium, or nitrides of these elements.
32. (Withdrawn) The method of claim 27, wherein forming the first oxide layer above the device structures includes:
- forming a field oxide layer and a  $\text{Si}_3\text{N}_4$  layer above the one or more device structures;
  - forming contact holes through the field oxide layer and the  $\text{Si}_3\text{N}_4$  layer;
  - depositing TiN in the contact holes;
  - forming tungsten on the TiN to form a contact plug; and
  - forming the first oxide layer on the  $\text{Si}_3\text{N}_4$  layer and contact plug.
33. (Withdrawn) The method of claim 27, wherein forming the number of trenches in the first oxide layer includes:
- forming a layer of  $\text{Si}_3\text{N}_4$  on the first oxide layer;
  - applying a layer of resist;
  - forming a damascene image in the resist and  $\text{Si}_3\text{N}_4$  layers; and
  - applying an oxide etch to define the number of trenches in the first oxide layer at locations of the damascene image.
34. (Withdrawn) The method of claim 33, wherein the method further includes after forming the first conductive layer removing the resist layer by a selective etch such that the first oxide layer is essentially unaltered by the selective etch.
35. (Withdrawn) The method of claim 27, wherein depositing the core conductive layer includes selectively depositing aluminum.
36. (Withdrawn) The method of claim 27, wherein depositing the core conductive layer includes selectively depositing aluminum by plating in an ambient air environment.

37. (Withdrawn) The method of claim 27, wherein depositing the capping layer on the core conductive layer includes implanting titanium ions into the core conductive layer.

38. (Withdrawn) The method of claim 37, wherein the method further includes exposing the titanium to nitrogen to form TiN.

39. (Withdrawn) The method of claim 27, wherein the method further includes removing at least a portion of the first oxide layer, after depositing the capping layer on the core conductive layer, to form an air bridge structure.

40. (Withdrawn – Currently Amended) A method of forming a memory device comprising:  
forming an array of memory cells in a substrate; and

forming a wiring structure in the substrate coupling to the array of memory cells, at least a portion of the wiring structure formed by a method including:

forming a first conductive layer in an opening in a multilayer dielectric structure supported by a substrate, the first conductive layer being an adhesion/barrier layer;

depositing a seed layer on the first conductive layer;

forming a core conductive layer on the seed layer, the core conductive layer substantially including ~~of~~ one or more of aluminum, silver, or gold;

subjecting the core conductive layer to a H<sub>2</sub> plasma treatment; and

depositing a capping layer on the core conductive layer after the H<sub>2</sub> plasma treatment, the capping layer being a conductive adhesion/barrier layer.

41. (Withdrawn) The method of claim 40, wherein forming the first conductive layer includes forming a layer of a refractory metal.

42. (Withdrawn) The method of claim 40, wherein forming the first conductive layer includes forming a layer of a compound of nitrogen and a tantalum alloy or a compound of nitrogen and a tungsten alloy.

43. (Withdrawn) The method of claim 40, wherein forming the core conductive layer includes forming the core conductive layer at a temperature ranging from room temperature to about 250°C.
44. (Withdrawn) The method of claim 40, wherein depositing the capping layer includes depositing one or more materials selected from titanium, zirconium, hafnium, or nitrides of these elements.
45. (Withdrawn) The method of claim 40, wherein depositing the capping layer includes depositing the capping layer having a thickness ranging from about 5 Å to about 40 Å.
46. (Withdrawn) The method of claim 40, wherein forming the core conductive layer includes forming the core conductive layer in the opening in the multilayer dielectric structure such that the core conductive layer is within one dielectric layer in the multilayer dielectric structure.
47. (Withdrawn) The method of claim 46, wherein forming the core conductive layer within one dielectric layer includes forming the core conductive layer within a polymer layer, a foamed polymer layer, a fluorinated polymer layer, an oxide layer, a silicon oxide layer, a fluorinated oxide layer, or an aerogel layer.
48. (Withdrawn – Currently Amended) A method of forming an electronic system comprising:
- providing a controller;
  - coupling the controller to one or more integrated circuits, at least the controller or one integrated circuit having a wiring structure on a substrate, at least a portion of the wiring structure formed by a method including:
    - forming a first conductive layer in an opening in a multilayer dielectric structure supported by a substrate, the first conductive layer being an adhesion/barrier layer;
    - depositing a seed layer on the first conductive layer;



forming a core conductive layer on the seed layer, the core conductive layer substantially including ~~of~~ one or more of aluminum, silver, or gold;  
subjecting the core conductive layer to a H<sub>2</sub> plasma treatment; and  
depositing a capping layer on the core conductive layer after the H<sub>2</sub> plasma.

49. (Withdrawn) The method of claim 48, wherein forming the first conductive layer includes forming a layer of a refractory metal.
50. (Withdrawn) The method of claim 48, wherein forming the first conductive layer includes forming a layer of a compound of nitrogen and a tantalum alloy; or a compound of nitrogen and a tungsten alloy.
51. (Withdrawn) The method of claim 48, wherein forming the core conductive layer includes forming the core conductive layer at a temperature ranging from room temperature to about 250°C.
52. (Withdrawn) The method of claim 48, wherein depositing the capping layer includes depositing one or more materials selected from titanium, zirconium, hafnium, or nitrides of these elements.
53. (Withdrawn) The method of claim 48, wherein depositing the capping layer includes depositing the capping layer having a thickness ranging from about 5 Å to about 40 Å.
54. (Withdrawn) The method of claim 48, wherein forming the core conductive layer includes forming the core conductive layer in the opening in the multilayer dielectric structure such that the core conductive layer is within one dielectric layer in the multilayer dielectric structure.
55. (Withdrawn) The method of claim 54, wherein forming the core conductive layer within one dielectric layer includes forming the core conductive layer within a polymer layer, a foamed

polymer layer, a fluorinated polymer layer, an oxide layer, a silicon oxide layer, a fluorinated oxide layer, or an aerogel layer.

56. (Withdrawn) The method of claim 48, wherein providing the controller includes providing a processor.

57. (Withdrawn) The method of claim 48, wherein forming the electronic system includes providing a computer.

58. – 103. (Cancelled)

104. (Withdrawn) The method of claim 1, wherein the method includes forming the electronic device configured as an integrated circuit.

105. (Withdrawn) The method of claim 1, wherein the method includes forming the electronic device configured as a memory device.

106. (Withdrawn) The method of claim 1, wherein the method includes forming the electronic device configured as part of an electronic system.